IN THE CLAIMS

Please cancel Claims 11-14 without prejudice as follows:

1. (Previously presented) A method of positioning a blood pressure sensor including locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel;

evaluating reflections of said acoustic energy from said tissue and said blood vessel,

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to said blood vessel,

said act of identifying comprising automatically detecting a local minimum indicative of both lateral position and depth; and

positioning said blood pressure sensor based at least in part on said act of locating.

2. (Previously presented) The method of Claim 1, wherein said blood pressure sensor comprises a tonometric sensor, and said act of evaluating comprises analyzing at least one A-mode line.

3. (Original) The method of Claim 2, further comprising correlating said at least one region to a depth location within said tissue based on said act of analyzing said at least one A-mode line.

4. (Previously presented) The method of Claim 2, wherein said act of identifying comprises:

forming at least one integrated power representation based on said reflections; and

identifying at least one artifact within said at least one integrated power representation, said at least one artifact corresponding to the lumen of said blood vessel.

5. (Original) The method of Claim 4, wherein the act of identifying at least one artifact comprises identifying at least one plateau within a normalized integrated power profile.

6. (Original) The method of Claim 1, wherein said act of identifying comprises:

measuring the signal level of said reflections as a function of depth within said tissue; and

identifying the lumen of said blood vessel based on at least one feature identified during said act of measuring.

7. (Cancelled)

8. (Previously presented) A method of positioning a pressure transducer including locating a blood vessel in tissue, comprising:

generating at least one beam of acoustic waves;

transmitting said at least one beam of acoustic waves into said tissue, said beam moving with respect to said tissue so as to ensonify different portions of said tissue as a function of time;

receiving energy backscattered by said tissue and said blood vessel;

analyzing said backscattered energy to identify at least one plateau therein, said at least one plateau resulting from the lumen of said blood vessel;

correlating said at least one plateau to the location of said blood vessel; and

positioning said pressure transducer based at least in part on said location of said blood vessel.

9. (Cancelled)

10. (Previously presented) The method of Claim 1, wherein the act of identifying comprises:

determining a power metric from said reflections;

integrating said power metric to produce a power function;

normalizing said power function;

dividing said normalized power function into a plurality of intervals; and

evaluating at least one of said intervals to identify said artifact.

11. – 18. (Cancelled)

19. (Previously presented) Blood pressure sensor positioning apparatus, comprising:

a pressure sensor;

apparatus adapted to move said pressure sensor;

at least one transducer capable of transmitting an acoustic wave into tissue containing a blood vessel and receiving a plurality of echoes therefrom, said at least one transducer configured to generate first signals related to said echoes;

a processor, operatively connected to said at least one transducer, and configured to process said first signals to determine the location of the lumen of said blood vessel by comparing a region of reduced energy reflection within said tissue as compared with higher levels of energy reflection in surrounding tissue; and

a controller, operatively coupled to said apparatus adapted to move, said controller positioning said pressure sensor based at least in part on said location of the lumen;

wherein said transmitting an acoustic wave further comprises sweeping transversely across said tissue.

20. (Previously presented) The apparatus of Claim 19, wherein said processor is adapted to determine a power profile associated with said echoes, and identify at least one artifact therein, said at least one artifact corresponding at least in part to said lumen.

21. (Previously presented) The apparatus of Claim 20, wherein said power profile is integrated over a variable corresponding to the propagation of said acoustic wave, and said at least one artifact comprises a plateau within said integrated power profile.

22. (Previously presented) The apparatus of Claim 19, wherein said processor is adapted to determine the Doppler shift associated with blood present in said blood vessel.

23. (Previously presented) The apparatus of Claim 19, wherein said processor is adapted to compare the signal level of at least a portion of said echoes and identify at least one artifact therein.

24. (Previously presented) The apparatus of Claim 23, wherein said signal level comprises an envelope-squared metric, and said at least one artifact comprises a reduction in the magnitude of said envelope-squared metric, said reduction corresponding to said lumen of said blood vessel.

25. – 35. (Cancelled)

36. (Previously presented) A method of positioning a blood pressure sensor including locating a blood vessel disposed within surrounding tissue, comprising the steps of:

transmitting acoustic energy into said tissue including said blood vessel to generate reflections thereof;

receiving said reflections of said acoustic energy from said tissue and said blood vessel;

forming at least one integrated power representation to identify at least one region of reduced energy reflection within said tissue, said at least one region corresponding to the lumen of said blood vessel;

locating said blood vessel based on the location of said lumen; and

positioning said sensor based at least in part on said act of locating.

37. (Cancelled)

38. (Previously presented) Blood vessel locating apparatus, comprising:

at least one first transducer capable of transmitting an acoustic wave into a blood vessel and receiving a plurality of echoes therefrom, said first transducer configured to generate first signals related to said echoes;

at least one pressure transducer capable of obtaining pressure signals from said blood vessel;

at least one signal converter, operatively coupled to said at least one first transducer and adapted to produce second signals from said first signals;

at least one digital processor, operatively coupled to said analog-to-digital converter, and configured to process said second signals; and

a computer program running at least in part on said digital processor, said computer program being adapted to determine a power profile based on said second signals, and to determine the location of the lumen of said blood vessel based at least in part on one or more artifacts present within said power profile; said computer program further being adapted to measure pressure within said blood vessel based at least in part on said pressure signals.

39. – 40. (Cancelled)

41. (Previously presented) The method of Claim 1, wherein said act of evaluating further comprises detecting an envelope associated with said reflections.

42. (Previously presented) The method of Claim 41, wherein said act of envelope detecting comprises:

providing an A-mode representation of said reflections;

multiplying at least a portion of said A-mode representation by the sine and cosine functions to produce a demodulated signal; and

lowpass filtering said demodulated signal.

43. (Previously presented) The method of Claim 42, wherein said act of lowpass filtering comprises filtering with a FIR filter, said FIR filter having a plurality of coefficients associated therewith

44. (Previously presented) The method of Claim 42, further comprising applanating at least a portion of said tissue in order to reduce interference.

45. – 48. (Cancelled)

49. (Previously presented) A method of positioning a pressure sensor by locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel;

receiving reflections of said acoustic energy from said tissue and said blood vessel;

basebanding at least a portion of said received reflections to produce baseband data;

developing an envelope squared representation of said baseband data;

applying a depth-dependent gain to at least a portion of said envelope squared representation;

identifying said blood vessel based at least in part on the output of said act of applying; and

positioning said sensor based at least in part on said act of identifying.

50. (Previously presented) The method of Claim 49, further comprising decimating at least a portion of said data or said envelope squared resp.

51. (Cancelled)

52. (Cancelled)

53. (Previously presented) A method of locating at least one wall of a blood vessel, comprising:

purposely compressing the tissue surrounding at least a portion of said vessel so as to collapse interposed vessels;

transmitting acoustic energy into the blood vessel;

receiving reflected energy from said blood vessel;

detecting at least one region associated with the lumen in said blood vessel from said reflected energy;

starting at said at least one region, computing an integrated power in a first direction;

evaluating said integrated power as a function of said direction; and

detecting the location of said at least one wall of the blood vessel based at least in part on said act of evaluating.

54. (Previously presented) The method of Claim 53, wherein said received reflected energy is used to form A-mode signals, and said act of computing an integrated power comprises summing consecutive samples of the square of the envelope of said A-mode signals in said first direction.

55. (Previously presented) The method of Claim 1, wherein said blood pressure sensor comprises a tonometric pressure sensor, and said act of transmitting comprises transmitting from an ultrasonic device, said pressure sensor and said ultrasonic device being substantially co-located.

56. – 58. (Cancelled)

59. (Previously presented) A method of locating a first blood vessel disposed within surrounding tissue, comprising:

applanating at least said tissue, said applanating comprising at least partly compressing one or more second blood vessels proximate to said first blood vessel;

transmitting acoustic energy into said tissue including said first blood vessel;

evaluating reflections of said acoustic energy from said tissue and said first blood vessel; and

identifying at least one region of reduced energy reflection within said tissue as compared with higher levels of energy reflection in surrounding tissue, said at least one region corresponding to said first blood vessel.

60. (Previously presented) The method of Claim 59, wherein said act of at least partly compressing results in reducing interference with said act of identifying, said reducing of interference resulting at least in part from compression of said one or more second blood vessels.

61. (Previously presented) A method of positioning a blood pressure sensor including locating a blood vessel disposed within surrounding tissue, comprising:

a step for transmitting acoustic energy into said tissue including said blood vessel;

a step for evaluating reflections of said acoustic energy from said tissue and said blood vessel;

a step for identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to said blood vessel, said step for identifying comprising at least a step for automatically detecting a local minimum indicative of both lateral position and depth; and

a step for positioning said blood pressure sensor based at least in part on said step for detecting.

62. (Previously presented) A method of positioning a pressure transducer including locating a blood vessel in tissue, comprising:

generating acoustic waves;

transmitting said acoustic waves into said tissue so as to ensonify different portions of said tissue as a function of time;

receiving energy backscattered by said tissue and said blood vessel;

analyzing said backscattered energy to identify at least one plateau therein, said at least one plateau resulting from the lumen of said blood vessel;

correlating said at least one plateau to the location of said blood vessel; and

positioning said pressure transducer based at least in part on said location of said blood vessel.

63. (Previously presented) Blood pressure sensor positioning apparatus, comprising:

means for sensing pressure;

means for moving said means for sensing pressure;

means for transmitting an acoustic wave into tissue containing a blood vessel and receiving a plurality of echoes therefrom, said means configured to generate first signals related to said echoes;

means for processing said first signals to determine the location of the lumen of said blood vessel by comparing a region of reduced energy reflection within said tissue as compared with higher levels of energy reflection in surrounding tissue, said means for processing being operatively connected to said means configured to generate said first signals; and

means for controlling said means for sensing pressure, said means for controlling being operatively coupled to said means for moving;

wherein said means for transmitting an acoustic wave further comprises means for sweeping transversely across said tissue.

64. (Previously presented) A method of positioning a tonometric blood pressure sensor including locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel to generate reflections thereof, and receiving said reflections of said acoustic energy from said tissue and said blood vessel;

forming at least one integrated power representation using at least said reflections;

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to the lumen of said blood vessel;

locating said blood vessel based on the location of said lumen; and

positioning said sensor based at least in part on said act of locating.

65. (Previously presented) Blood vessel locating apparatus further adapted for measuring blood pressure, comprising:

apparatus for transmitting an acoustic wave into a blood vessel and receiving a plurality of echoes therefrom;

apparatus for generating first signals related to said echoes;

apparatus for obtaining pressure signals from said blood vessel;

apparatus for converting said first signals to second signals;

apparatus for processing said second signals, said for processing being operatively coupled to said apparatus for converting; and

apparatus for determining a power profile based on said second signals, and for determining the location of the lumen of said blood vessel based at least in part on one or more

artifacts present within said power profile; said apparatus for determining further comprising apparatus for determining pressure within said blood vessel based at least in part on said pressure signals.

66. (Previously presented) A method of positioning a blood pressure sensor by locating a blood vessel disposed within surrounding tissue, comprising:

a step for transmitting acoustic energy into said tissue including said blood vessel;

a step for receiving reflections of said acoustic energy from said tissue and said blood vessel;

a step for producing basebanded data from at least a portion of said received reflections;

a step for developing an envelope squared representation of said baseband data;

a step for applying a depth-dependent gain to at least a portion of said envelope squared representation; and

a step for identifying said blood vessel based at least in part on the output of said step of applying.